PROSPECTS FOR CYCLODEXTRINS AND THEIR DERIVATIVES IN MEMBRANE PRODUCTION

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This presentation describes the preparation and characterization of polymeric membranes incorporated with cyclodextrin (CD) polyurethanes. CDs are cyclic oligosaccharides consisting of several glucopyranoside units arranged as toroids with wide-diameter inner cavities. These inner cavities have a tendency of allowing water to pass through. The interior surface of the CD toroid is hydrophobic, while the exterior is hydrophilic in nature making it more attractive for selective inclusion complexation. In this work, polysulfone membranes were blended with various concentrations (0.0 – 10%) of CDs to prepare membranes for the selective removal of Cd^{2+} ions from water at a working pH of 6.9. These hydrophilic membranes demonstrate excellent water permeability and higher salt rejection (up to 70%). We also demonstrate exceptional fouling behavior of polyamide thin-film composite (TFC) membranes modified with these monofunctionalized CDs through an *in-situ* interfacial polymerization process. Thus, the modified polyamide TFC membranes exhibited improved hydrophilicity, water permeability, and fouling resistance, while restricting the passage of monovalent salts. We present all the important aspects on this subject with respect to our recent results.

References

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